

REMARKS

This amendment and response is responsive to the Office Action of October 20, 2004.

The abstract has been objected to because it simply contains a recitation of elements and does not adequately provide a narrative description of the invention.

Claims 12-22 have been objected to because the preliminary amendment underlines the newly added claims.

Claims 11-22 have been rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-4, 7 and 8 have been rejected under 35 U.S.C. 102(b) as being anticipated by Hosokawa et al.

Claims 5, 6, 9 and 10 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa et al. in view of Sizer, II. Claims 11-15 and 18-22 have been rejected under the same statutory provision as being unpatentable over Hosokawa et al. in view of Maruko et al. Claims 16 and 17 have been rejected under the same statutory provision as being unpatentable over Hosokawa et al. and Maruko et al. as applied to claim 11 and further in view of Shinmura et al.

By this amendment claims 1-19 and 21-22 have been amended. Claims 2, 6, 10 and 20 have been canceled.

OBJECTIONS TO THE SPECIFICATION

The abstract has been amended to provide a narrative description of the invention.

CLAIM OBJECTIONS

By this amendment, claims 12-19 and 21-22 have been amended to correct the improper format used in the preliminary amendment. Claim 20 has been canceled.

35 U.S.C. 112 REJECTIONS

Claim 11 has been amended to recite a method of avoiding a vehicle collision comprising "circumferentially detecting bodies proximate the vehicle; obtaining data from a rotating pulsed infrared laser beam scanner apparatus including a time when the beam reaches a first edge of each body and a time when the beam reaches a second edge of each body; determining a relative distance from the scanner apparatus to each body; determining a time to collision with each body; and determining a braking force to avoid a collision with each body." Withdrawal of this rejection is respectfully requested.

Claim 12 has been amended to recite the "method of avoiding a vehicle collision of claim 11, further comprising determining a critical point at which an absolute value of the derivative of each bodies acceleration with respect to time approaches zero." Withdrawal of this rejection is respectfully requested.

Claim 18 has been amended to recite the "method of avoiding a vehicle collision of claim 11, wherein determining the time of collision further comprises determining vertical and horizontal components of each body." Withdrawal of this rejection is respectfully requested.

Claim 20 has been canceled.

Applicant submits that claims 13-17, 19, 21 and 22 now depend either directly or indirectly from amended claim 11 which now particularly points out and distinctly claims the subject matter which the applicant regards as the invention. Withdrawal of these rejections is respectfully requested.

35 U.S.C. 102 REJECTIONS

Claims 1-4, 7 and 8 stand rejected under 35 U.S.C. 102(b) as being anticipated by Hosokawa et al. Hosokawa et al. disclose a radar apparatus including a rotary polygon mirror with a plurality of mirror surfaces inclined at different angles. A semiconductor laser diode and a collimator lens are disposed above the polygon mirror. An infrared pulse beam emitted from the semiconductor laser diode is reflected by a reflection mirror disposed at an upper position in front of the polygon mirror to reflect the pulse beam obliquely downward toward the rotary polygon mirror so that the pulse beam is reflected as a transmission beam advancing toward a measuring area in a forward direction. A light receiving means receives the transmission beam returned from an object positioned within the measuring area. As shown in FIG. 5, the scanning area 81 includes an area oriented ahead of the vehicle and the scanning angle is limited to 120 degrees by the use of polygon mirror 31 as shown in FIGS. 11A and 11B.

In contrast, and as claimed in amended independent claim 1, the vehicle collision avoidance system of the present invention comprises "a circumferentially rotating pulsed infrared laser beam scanner apparatus". The claimed system provides detection of obstacles circumferentially of the vehicle in contrast to the Hosakawa et al. apparatus. Withdrawal of this rejection is respectfully requested.

Dependent claims 3-4 depend either directly or indirectly from amended independent claim 1 and include all of the limitations thereof. Withdrawal of this rejection is respectfully requested.

Amended independent claim 7 recites a method of avoiding a vehicle collision comprising "determining features of an obstacle using a circumferentially rotating pulsed infrared laser beam scanner apparatus". For the reasons discussed above, the cited reference does not anticipate the invention as claimed in amended independent claim 7. Withdrawal of this rejection is respectfully requested.

Claim 8 depends from amended independent claim 7 and recites all of the limitations thereof. Withdrawal of this rejection is respectfully requested.

35 U.S.C. 103 REJECTIONS

Claims 5, 6, 9 and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa et al. in view of Sizer, II. Sizer, II discloses a Nd: YAG laser for use in a high repetition rate laser source having high power. The Sizer, II Nd: YAG laser is not appropriate for use in a vehicle collision avoidance system as it does not meet maximum permissible exposure limits (MPE). As recited in amended claim 5, the circumferentially rotating pulsed infrared laser beam scanner apparatus emits a laser beam having "a wavelength between 1um and 1.550 um excluding the region between 1.3um and 1.4um". Such a laser is not shown or disclosed by Sizer, II. Additionally, amended claim 5 depends from amended independent claim 1 and includes all of the limitations thereof which are not shown or suggested by the cited references. Withdrawal of this rejection is respectfully requested.

Claim 6 has been canceled.

Claims 11-15 and 18-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa et al. in view of Maruko et al. Maruko et al. disclose a braking control system with object detection system interaction . A scanning laser radar sensor is used as the object detector 31 to capture, recognize, sense or detect the preceding vehicle (or relevant target vehicle) or a frontally located object, and to monitor a vehicle-to-vehicle distance (or an inter-vehicle distance or a separating distance between the host vehicle and the preceding vehicle) or a relative distance L of the frontally located object (or the preceding vehicle) relative to the host vehicle, and to monitor a relative angle theta of the direction of the preceding vehicle's motion or relative to the object. Thus Maruko et al. do not show or suggest the use of a circumferentially rotating pulsed infrared laser beam scanner as recited in amended independent claim 11. Withdrawal of this rejection is respectfully requested.

Amended claims 12-15 and 18-22 depend either directly or indirectly from amended independent claim 11 and include all of the limitations thereof. For the reasons discussed above, the cited references do not show or suggest the recited features of the present invention. Withdrawal of this rejection is respectfully requested.

Claims 16 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hosokawa et al. and Maruko et al. as applied to claim 11 and further in view of Shinmura et al. Shinmura et al. disclose a collision avoiding system for vehicles for enhancing a collision avoiding effect by stabilizing a vehicle behavior during automatic braking. A laser-radar head unit 8 acts as an obstacle detecting means for detecting an obstacle ahead of a vehicle. Thus Shinmura et al. do not show or suggest the use of a circumferentially rotating pulsed infrared laser beam scanner as recited in amended independent claim 11. Amended claims 16 and 17 depend either directly or indirectly from amended independent claim 11 and include all of the limitations thereof. The cited references do not show or suggest the recited

features of the present invention. Withdrawal of this rejection is respectfully requested.

CONCLUSION

All of the claims now remaining in the application are in condition for allowance and an indication to that effect is respectfully requested. The Examiner is invited to contact the undersigned with any questions regarding the present amendment.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on February 22, 2005.



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